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CLAIMS

1. A device that reduces the volatility of radioactive waste comprising:
 - (a) a receptacle having an open end said open end having a means for affixing a lid securely to said receptacle,
 - 10 (b) a absorbent matrix comprising a humectant, a pH-stabilizing agent and an adsorbent material said matrix insertable into said receptacle and
 - (c) A lid.
- 15 2. A device according to claim 1 wherein said radioactive waste comprises a radioactive isotope selected from the group consisting of ^{125}I and ^{131}I .
3. A device according to claim 1 wherein said radioactive waste comprises a radioactive isotope selected from the group consisting of ^{36}Cl , ^{33}P , ^{32}P , ^{35}S ,
20 ^{18}F , ^{15}O , ^{14}C , ^{13}N , ^{11}C , and ^3H .
4. A device according to claim 1 wherein said receptacle is constructed of one or more of the materials selected from the group consisting of metal, ceramic, plastic and glass.
- 25 5. A device according to claim 1 wherein said receptacle is constructed of a plastic.
6. A device according to claim 1 wherein said absorbent matrix is
30 constructed of one or more natural materials, one or more synthetic materials or a combination of one or more natural and one or more synthetic materials.

- 5 7. A device according to claim 5 wherein said natural material is selected from the group consisting of cotton, wool, paper, vermiculite, starch and diatomaceous earth.
8. A device according to claim 5 wherein said synthetic material is selected
10 from the group consisting of fiberglass, cellulose derivatives, dextrans, polyacrylamide and hydrophilic polymers.
9. A device according to claim 1 wherein said absorbent matrix is constructed of unidirectional cotton fibers.
- 15 10. A device according to claim 1 wherein said pH-stabilizing agent is prepared from one or more of the following compounds selected from the group consisting of TRIS, dibasic phosphonate salts, tribasic phosphonate salts, sodium borate, the sodium salt of glycine, potassium acetate and
20 potassium hydroxide.
11. A device according to claim 1 wherein said pH-stabilizing agent is dibasic phosphonate salts.
- 25 12. A device according to claim 1 wherein said adsorbent material is starch or polymeric resins.
13. A device according to claim 1 wherein said adsorbent material is activated charcoal.
- 30 14. A composition comprising an absorbent matrix, a humectant, a pH-stabilizing agent and adsorbent material.

- 5 15. A composition according to claim 14 wherein the absorbent matrix is constructed of unidirectional cotton fibers.
16. A composition according to claim 14 wherein the humectant is glycerol.
- 10 17. A composition according to claim 14 wherein the pH-stabilizing agent is composed of dibasic phosphonate salts.
18. A composition according to claim 14 wherein the adsorbent material is activated charcoal.
- 15 19. A composition according to claim 14 wherein the absorbent matrix contains about 3 to about 20 parts glycerol, about 1 to about 10 parts of a compositions of disodium phosphonate salts and about 0.5 to about 10 parts activated charcoal.
- 20 20. A method of reducing the volatility of radioactive waste using the device of claim 1 comprising the steps of:
- (a) inserting a absorbent matrix containing a humectant, a pH-stabilizing agent and an adsorbent material into a receptacle,
- 25 (c) depositing a radioactive waste into said receptacle and
- (b) sealing said receptacle with a lid.
21. A kit for reducing the volatility of radioactive waste comprising:
- (a) at least one receptacle having an open end said open end having a means for affixing a lid securely to a receptacle,
- 30 (b) at least one absorbent matrix comprising a humectant, a pH-stabilizing agent and an adsorbent material that may be inserted into said receptacle and

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(c) at least one lid.

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